A SIMPLE METHOD OF CONSTRUCTING A HYPERBOLIC PARABOLOID.

By E. J. Cuy [Couyumdjopoulos].

The famous "saddle-shaped surface," $z = ax^2 - by^2$, so useful in demonstrating the peculiarities of fairly complex surfaces, —such, for example, as the fact that a surface may give a curve with a maximum (a parabola) as its intersection with one of the coördinate planes, a curve with a minimum with another and two straight lines with the third,—is not a very easy surface to construct.

The following is a simple method of constructing it:—

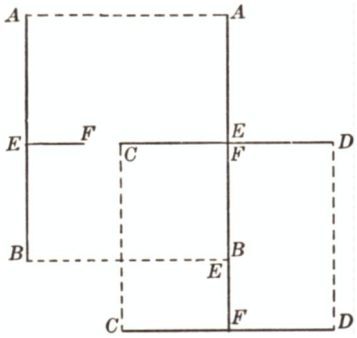

Fig. 1.

Two equal pieces of straight stiff wire (or glass rod), *AB* and *CD*, are soldered to a third piece *EF* perpendicular to it and perpendicular to each other, as shown in figures 1 and 2. Then starting at *E*, *EA* and *EB* are divided into an equal number of equal parts. *CF* and *FD* are divided similarly.

Then by means of thread join point 1 of *AE* to point 1 of *CF*, point 2 of *AE* to 2 of *CF*, etc. A shellac coating on *AB* and *CB* before and after winding the thread will keep it in position.

If *AB* is now rotated about *EF* through an angle of 45° and the midpoint *G* of *EF* is chosen as the origin, *EF* will be the

x-axis of the hyperbolic paraboloid, and a vertical and a horizontal line both perpendicular to EF at G will be the z- and the y-axes respectively.

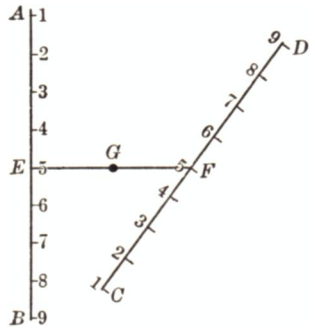

FIG. 2.

If either E or F is used as the origin and EF as the z-axis, the equation of the surface will be

$$xz = (c - z)y, \quad \text{or} \quad (x + y)z = cy.$$

CLARK UNIVERSITY,
WORCESTER, MASS.